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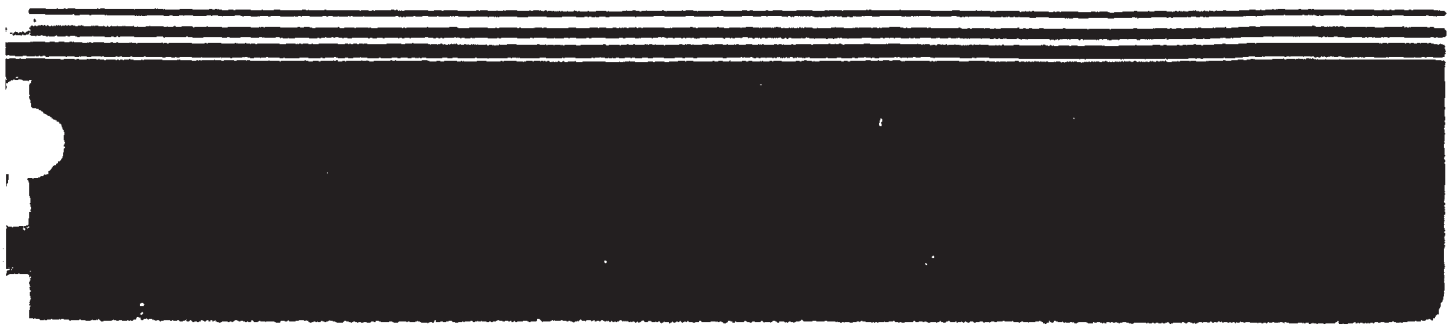
Superfund Record of Decision:

San Gabriel/Area I Site, CA



TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA/ROD/R09-84/004	2.
3. RECIPIENT'S ACCESSION NO.	
4. TITLE AND SUBTITLE SUPERFUND RECORD OF DECISION: San Gabriel Area 1, CA	5. REPORT DATE 05/11/84
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460	13. TYPE OF REPORT AND PERIOD COVERED Final ROD Report
	14. SPONSORING AGENCY CODE 800/00
15. SUPPLEMENTARY NOTES	

16. ABSTRACT

The San Gabriel Area I site is affected by one of four contaminated ground water plumes affecting the San Gabriel ground water basin, approximately 40 miles east of Los Angeles. Testing of wells by the California Department of Health Services (DOHS) found areas of the basin contaminated with trichloroethylene (TCE), tetrachloroethyl- (PCE), and other chlorinated hydrocarbons. The DOHS has set Action Levels for TCE and PCE at the EPA suggested no adverse response level (SNARL) of 5 ppb and 4 ppb, respectively. The three mutual water companies whose wells have been affected by the contamination serve a population of approximately 200,000.

The selected initial remedial measure (IRM) is installation of an air stripping system to treat contaminated ground water from the affected water mutual wells. The capital cost for the project is $525,000 and annual O&M is estimated to be $38,000.

Key Words: Ground Water Contamination, Environmental Standard, Initial Remedial Measure, Risk Level, SNARL, Air Quality, Air Permit, Carbon Adsorption, Air Stripping, Data Adequacy, Trend Analysis

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision San Gabriel Area I, CA Contaminated media: gw Key contaminants: solvents, TCE, PCE		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)* None	21. NO. OF PAGES 64
	20. SECURITY CLASS *(This page)* None	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

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ROD ISSUES ABSTRACT

Site: San Gabriel Area 1, California

Region: IX

AA, OSWER
Briefing Date: March 14, 1984

SITE DESCRITION

The San Gabriel Area I site is affected by one of four contaminated ground water plumes affecting the San Gabriel ground water basin, approximately 40 miles east of Los Angeles. Testing of wells by the California Department of Health Services (DOHS) found areas of the basin contaminated with trichloroethylene (TCE), tetrachloroethylene (PCE), and other chlorinated hydrocarbons. The DOHS has set Action Levels for TCE and PCE at the EPA suggested no adverse response level (SNARL) of 5 ppb and 4 ppb, respectively. The three mutual water companies whose wells have been affected by the contamination serve a population of approximately 200,000.

Selected Alternative

The selected initial remedial measure (IRM) is installation of air stripping system to treat contaminated ground water from the affected water mutual wells. The capital cost for the project is $525,000 and annual O&M is estimated to be $38,000.

ISSUES AND RESOLUTIONS

1. SNARL's can be appropriately utilized as guides for deciding if an IRM should be conducted. They can also be used as an aid to establish cleanup levels. SNARL's at 10^{-6} risk are acceptable goals. IRM alternatives should be developed to meet the 10^{-6} level if they are cost effective. If this level can not be achieved, a higher risk level might be necessary.

KEY WORDS

- Ground Water Contamination
- Environmental Standard
- Initial Remedial Measure
- Risk Level
- SNARL

and TCE that exceed the EPA Suggested No Adverse Response Levels (SNARL). [Note: the SNARL level referred to throughout this summary is based on a lifetime risk of contracting cancer of 10^{-6}]. The water purveyors whose wells have been affected by this contamination serve a population of approximately 200,000. Cities and public water companies in the area have been directed by DOHS to conduct at least monthly tests of their wells to ensure that their water supplies are safe for human consumption. DOHS has set Action Levels for TCE and PCE at the EPA SNARL levels (5 and 4 ppb, respectively). If alternative methods of reducing PCE and TCE concentrations below the Action Levels (such as blending waters from different wells) are not effective, wells must be removed from service.

Currently, there are three mutual water companies—Richwood, Rurban Homes, and Hemlock—that have no alternative water supply and have been providing their customers with water that is contaminated with PCE at concentrations above the DOHS Action Level. At present, no other organics have been found at levels above the DOHS action limits in the mutuals' wells. Mutual water companies are cooperatively owned water companies; in other words, the customers own shares in the company.

SITE HISTORY

In 1980, the State of California conducted an extensive well water testing program in the San Gabriel basin. Out of 246 wells tested, 37 were found to have TCE concentrations greater than the Action Level of 5 ppb. During this same period, the Los Angeles Regional Water Quality Control Board (RWQCB) conducted a survey of 233 industries for the purpose of obtaining information regarding past and present TCE usage. The results indicated that a minimum of 28 industries used and continued to use or store TCE. Due to the complex nature of the area's hydrogeology and the plume configuration, no specific source of the contamination could be identified. The study concluded that the problem resulted from industrial practices 15 to 30 years ago, and that there was little likelihood that current industrial use was making a major contribution to the problem. The study did, however, recommend some industries for further investigation. When the RWQCB report was released on April 25, 1980, the State announced its plan, described above, requiring periodic testing of wells to ensure that public water supplies do not contain concentrations of TCE or PCE above the EPA SNARL levels.

The San Gabriel site was ranked 13th on the priority list for the State Superfund program. On January 27, 1983, the State requested EPA assistance in addressing the problem of ground water contamination in the San Gabriel basin. On February 28, EPA Region IX submitted this site for inclusion on the National Priorities List (NPL). For purposes of scoring with the Hazard Ranking System (HRS), the San Gabriel area was separated into 4 separate sites based upon the estimated location of the major plumes of ground water contamination. The four areas were included in the proposed update to the NPL issued September 8, 1983. On May 1, 1984, the EPA Administrator signed the notice of rulemaking placing the San Gabriel sites on the final NPL. Although they were scored separately, the sites will be combined for the purpose of investigating and managing the overall ground water contamination problem in the San Gabriel basin.

In May 1983, a management committee comprised of various local and State agencies, EPA, and representatives of various water companies and public interest organizations was established with California DOHS as its chair. The objectives of this committee were: 1) to find a solution for the three mutual water companies that have a well contamination problem and no alternative water supply; 2) to identify and control any TCE/PCE sources; and 3) to develop an overall strategy for management of the plumes.

Since the first objective was the most urgent of all three, the State requested that EPA conduct a focused feasibility study (FFS) to evaluate alternative water supplies for the three mutuals. The initial remedial measures recommended in this Record-of-Decision are based on the results of the FFS. To accomplish the second goal, EPA has initiated the source investigation activities described in the enforcement section below. As a first step toward meeting the third goal, EPA's contractor, CH2M Hill, has prepared a draft Remedial Action Master Plan (RAMP) to guide further action concerning these areas. The first draft of the RAMP was completed in October 1983. CH2M Hill is presently redrafting the RAMP based on EPA's comments on the draft. EPA will use the final RAMP as the basis for developing the Scope of Work for a Remedial Investigation/Feasibility Study (RI/FS) of the overall ground water contamination problem in the San Gabriel Valley.

SITE STATUS

Of all the water purveyors in the basin, only the three mutual water companies mentioned above (located in San Gabriel Area 1) are currently unable to supply water that has contamination levels below the EPA SNARL levels, due to lack of any alternative water supply. Consequently, EPA and the State have identified a need for initial remedial measures (IRM) to assist these water purveyors in mitigating their water contamination problem.

Richwood Mutual Water Company serves approximately 204 households with water from two wells. PCE was first detected in October 1980, and since that time has been found in concentrations ranging from 12 to 92 ppb, greatly exceeding the SNARL level if 4 ppb. The most current data show PCE levels of 62 ppb for Well No. 1 (6/1/83) and 92 ppb for Well No. 2 (5/17/83). In addition to a PCE contamination problem, Richwood suffers from potential bacteriological problems and a severely deteriorated distribution system. Well No. 2 was temporarily taken out of service in May 1983, so that bacteriological problems could be eliminated by chlorination.

Hemlock Mutual Water Company owns two wells and provides water to approximately 199 households. PCE was first detected in May 1982. The South Well was taken out of service in 1982, on the order of the Los Angeles County Department of Health Services (LACDHS) when a PCE level of 184 ppb was detected. The latest test results showed PCE levels of 50 ppb in the South Well (12/14/82) and 38 ppb in the North Well (4/12/83). Hemlock has considered using an activated carbon treatment system to lower PCE levels. Pilot tests of the system were performed from February through April 1983; the tests showed that PCE will be removed. Hemlock has bought the system from a vendor, but it is not yet in operation. At EPA's Region IX's request, CH2M Hill

reviewed the design of the Hemlock carbon filter system; their analysis concluded that the system was underdesigned and did not include a margin of safety normally included in these systems. This analysis will be discussed in a later section of this document.

Rurban Homes Mutual Water Company serves approximately 290 households with water from two wells. PCE was detected first in October 1980. The latest sampling data (5/17/83) showed PCE concentrations of 1.7 and 3.7 ppb for Wells No. 1 and 2, respectively. In the past, however, PCE concentrations have ranged as high as 16 ppb for Well No. 1 and 54 ppb for Well No. 2. This latest sampling is the first time the PCE concentration in both wells has been lower than 4 ppb since contamination was detected. However, results of sampling over time have shown significant fluctuations that do not indicate either an increasing or decreasing trend and the average concentration of PCE has remained above the DOHS action level. Therefore, the recent sampling cannot be considered sufficient evidence that the PCE SNARL level has been and will continue to be met in the near future. Because these two contaminated wells are Rurban's only water supply, EPA and the State have determined that a solution to Rurban's contamination problem should also be included in initial remedial measures for San Gabriel Area 1.

ENFORCEMENT

At the request of EPA Region IX, the Field Inspection Team (FIT) prepared a list of potentially responsible parties (PRP's) in the San Gabriel basin, for use in preparing RCRA Section 3007/CERCLA Section 104 letters. This list was based on the results of the 1980 RWQCB investigation, cited above, which identified several industries as warranting further investigation, and a review of records and the history of development in the San Gabriel basin.

EPA Region IX sent 16 section 3007/104 letters to PRP's on August 19, 1983, based on an initial list provided by FIT. This initial list was based primarily on the 1980 RWQCB study which focused on San Gabriel Area 2. Consequently, only two of these initial 16 PRP's are located in the San Gabriel Area 1. After FIT provided its final list of PRP's, Region IX sent 72 additional section 3007/104 letters to PRP's in the San Gabriel basin on January 12, 1984; 31 of these PRP's were located in San Gabriel Area 1.

Region IX staff are in the process of reviewing the responses to these 3007/104 letters as they are received. Facilities which show a high potential for having caused ground water contamination will be referred to FIT for site inspections. Four of the 16 PRP's on FIT's initial list have already been referred for inspections; however, none of these facilities is located in San Gabriel Area 1. As a result, administrative orders cannot be used to compel implementation of the IRM at this time, because evidence linking specific responsible parties to ground water contamination in San Gabriel Area 1 has not yet been produced.

EPA Region IX will conduct a source investigation of the San Gabriel basin. As part of that effort, FIT has prepared a source investigation workplan. The source investigation will be closely coordinated with the RI/FS for the San Gabriel basin to allow maximum utilization of ground water

monitoring wells and sampling. In addition, responsible parties identified through the source investigation may assume responsibility for hydrogeologic investigations (through the issuance of unilateral or consent administrative orders) in their area of contamination.

Since no responsible parties have been identified yet in San Gabriel Area 1, it is recommended that the Trust Fund be used to finance initial remedial measures at the San Gabriel Area 1 site. Immediate action must be taken to provide an uncontaminated water source for residents of El Monte served by the three mutual water companies. If parties responsible for contamination of the mutual water companies' wells are identified through the source investigation, a cost recovery action can be taken to recover Trust Fund monies used for the implementation of initial remedial measures in San Gabriel Area 1.

ALTERNATIVES EVALUATION

Purpose and Objective

The purpose of the IRM is to develop an alternative water supply or a treatment system that will enable the three mutual water companies described above—Richwood, Rurban Homes, and Hemlock—to supply drinking water with levels of PCE contamination below the EPA SNARL level of 4 ppb.

The public health objective for the IRM is to ensure that all residents affected by ground water contamination in San Gabriel Area 1 are provided with a drinking water supply that is below the EPA SNARL level for PCE—4 ppb. This level is based on a cancer risk level of 10^{-6}, (i.e., that a person exposed to this level of contamination in drinking water throughout his or her lifetime (70 years) will bear a risk of less than or equal to 1 in 1,000,000 of contracting cancer as a result of ingesting PCE). The IRM for San Gabriel Area 1 will ensure that this objective is met during the interim period before a long-range solution to ground water contamination in the San Gabriel basin can be implemented. During implementation of the IRM, a remedial investigation and feasibility study (RI/FS) will begin to determine the appropriate long-term solution. The long-term solution, however, is not expected to be in place until five years from now due to the complex technological issues associated with area-wide ground water contamination.

Alternatives Considered

The following IRM alternatives were considered in the Focused Feasibility Study (FFS) conducted by CH2M Hill:

Alternative A - No Action

Alternative B - Drill Deeper Wells

Alternative C - Provide Bottled Water

Alternative D - Join With Another Water System

Alternative E - Obtain Water From a Nearby Purveyor

Alternative F - Connect to the Metropolitan Water District

Alternative G - Use Home Treatment Devices

Alternative H - Treat Well Discharge With Carbon Adsorption System

Alternative I - Treat Well Discharge With Air-Stripping System

Each of these alternatives would be designed so as to comply with other appropriate environmental laws.

Initial Screening of Alternatives

The first step in screening the alternatives listed above was deletion from consideration of those alternatives not technically feasible or not likely to effectively mitigate and minimize the threat of harm to public health.

Alternative A--no action was eliminated because it would not mitigate the public health threat described above. Residents served by the three mutual water companies are presently drinking water that is contaminated with PCE at levels significantly above the EPA SNARL level of 4 ppb. Because of the health threat resulting from the no-action alternative, it was dropped from further consideration.

Alternative B--drilling existing wells deeper or drilling new wells to find uncontaminated water was also eliminated. The distribution of contamination in the aquifer has not yet been defined, so that the discovery of uncontaminated water cannot be ensured. Even if an uncontaminated water supply is found, the length of time it would remain uncontaminated is unknown. Therefore, this alternative was not considered feasible or reliable to limit exposure or threat of exposure to the contaminated ground water and was dropped from further consideration.

Detailed Evaluation of Alternatives

The remaining alternatives were evaluated regarding their effectiveness in meeting the objective of the IRM, and their total cost. A brief description of these alternatives follows:

Alternative C--Bottled Water - Using bottled water for drinking and cooking. Water would be delivered directly to homes in five gallon bottles. It was estimated that bottled water would be provided during the five-year period before the long-term remedy could be implemented.

Alternative D--Join With Another Water System - Assets of the mutual water companies would be transferred to a nearby water purveyor who would provide water to customers previously served by the mutuals. This alternative would require a vote of the mutuals' shareholders to dissolve.

Alternative E—Obtain Water From A Nearby Purveyor - Mutuals would obtain water while maintaining their water rights. This could be accomplished in two ways:

1. Mutuals maintain water rights: A nearby purveyor provides water to the mutuals and purchases replenishment water to replace the ground water removed in excess of its adjudicated allotment.

2. Mutuals lease water rights: A nearby purveyor provides water to the mutuals and the mutuals transfer or lease their water rights to the purveyor to increase its ground water allotment to cover the needs of the mutuals.

Alternative F—Connect to the Metropolitan Water District (MWD) - Build a two mile pipeline and storage reservoir to connect the mutuals to the MWD Middle Feeder (surface water) pipeline.

Alternative G—Use Home Treatment Devices - Install a carbon filter on the kitchen tap of each household.

Alternative H—Treat the Well Discharge With Carbon Adsorption System - Install a carbon filter system at each well to filter the water as it is pumped from the ground.

Alternative I—Treat the Well Discharge With Air-Stripping System - Install an air-stripping tower system at each well to treat the water as it is pumped from the ground. The contaminants would volatilize from the water and be emitted to the air from the tower.

The effectiveness of these alternatives in meeting the objective of the IRM was evaluated based on seven criteria:

1. Time - what is the amount of time needed to implement the alternative?

2. Reliability of Equipment - how reliable would the alternative be based on the operating characteristics of the machinery involved?

3. Operational Complexity - how difficult would it be to operate the alternative?

4. Permanence - how compatible would the alternative be with potential ultimate remedies for the area?

5. Institutional Complexity - how difficult would it be to implement the alternative from an administrative standpoint? How many parties, permits, and approvals would be needed to implement the alternative?

6. Community Impact - what changes in the normal way of life of the mutuals' members would be caused by the alternative?

7. Risk of Failure - what is the effectiveness of the alternative in protecting public health?

Each alternative was evaluated using these criteria. Criteria were given weighting factors to reflect the relative significance of each in the evaluation.

Criterion No. 7—risk of failure—was given the highest weighting factor (5) since it directly evaluates the effectiveness of the alternative in protecting public health, i.e., meeting the objective of the IRM.

The criteria were used to conduct a relative evaluation of each alternative. The results of the effectiveness evaluation are shown in Table 1. As a result of this evaluation, alternative G—use of home treatment devices—was eliminated from further consideration. It scored low in the effectiveness evaluation because of the maintenance required to replace the filter, the chance that a slug of highly contaminated water could get through the filter or exhaust the filter prior to the next change, low permanence, and the high risk of failure.

All of the other alternatives had approximately the same effectiveness evaluation scores, and were, therefore, determined to be equally effective in meeting the goal of the IRM.

Cost estimates were developed for each of the remaining alternatives; a summary of these estimates is given in Table 2. The costs listed in this table have been calculated in 1983 dollars. Annual costs have been discounted at a rate of 10 percent. Total 5-year costs are presented because the alternative being selected is for use as an IRM and is not considered the long-term remedy for the site. It is expected that within that time period, a final remedial alternative for the overall ground water contamination problem in the San Gabriel basin will be in place.

Two types of annual costs are presented for each alternative: operation and maintenance (O&M) costs and/or increased water costs. O&M costs include the costs to cover carbon changes, power, and maintenance requirements for the treatment alternatives, maintaining pipelines, or providing bottled water. Increased water costs are the increase in the cost of water for the different alternatives over what the mutuals' shareholders are presently paying.

Recommendation of the Feasibility Study

Since each of the remaining alternatives was determined to be equally effective in mitigating and minimizing the threat of harm to public health, the selection of the cost-effective alternative was based on cost. The three lowest-cost alternatives and their costs are summarized in the following table:

ALTERNATIVE	CAPITAL COSTS	5-YEAR O&M COSTS	5-YEAR INCREASED WATER COSTS	TOTAL 5-YEAR COSTS
E.2. Obtain Water From a Nearby Purveyor; Mutuals Lease Water Rights	$51,000	-	$401,000	$452,000
D. Join With Another Water System	$190,000	-	$316,000	$506,000
I. Treat Well Discharge With Air-Stripping System	$525,000	$157,000	-	$682,000

The lowest-cost alternative was alternative E.2.—obtain water from a nearby purveyor, mutuals lease water rights. This alternative was not recommended by the focused feasibility report, however, because nearby water purveyors indicated that they would not be willing to provide water to the mutuals under this option (as well as alternative E.1.).

Alternative D—join with another water system—was the second lowest-cost alternative. The San Gabriel Valley Water Company has been identified as the logical water company for the mutuals to join. The San Gabriel Valley Water Company has indicated that it would be willing to provide water under this alternative. In exchange for the mutuals' water rights, the San Gabriel Valley Water Company would replace and upgrade the mutuals' water delivery systems. This alternative, which would require dissolution of the mutuals, was not recommended in the focused feasibility study report because at the time the report was prepared, sufficient information did not exist to determine whether the mutuals would be willing to dissolve. Although not recommended in the focused feasibility study report because of the uncertainty of the mutuals' interest, EPA informed the mutuals that this alternative was a viable option for consideration.

Alternative I—treatment of well discharge with an air-stripping system—was the third lowest-cost alternative. It is by far the lowest cost alternative when alternatives E.2 and D are excluded (for the reasons cited above). Alternative I's cost is less than half that of the next lowest cost alternative that could be implemented—treatment of well discharge with a carbon adsorption system.

Therefore, because all of these alternatives have been judged to be equally effective in meeting the objective of the IRM, Alternative I—treatment of well discharge with an air-stripping system was recommended by the focused feasibility study report as the most cost-effective alternative.

Analysis of Hemlock Water Mutual Company's Carbon Adsorption System

During preparation of the focused feasibility study, EPA was notified that Hemlock Mutual Water Company had purchased a carbon adsorption system from the Downey Welding and Manufacturing Company, Inc. At the request of EPA Region IX, CH2M Hill reviewed the design of this system based on details regarding the system provided by Downey Welding. CH2M Hill's analysis of this system determined that its capacity was underdesigned, and that the system does not provide the margin of safety normally built into treatment systems of this type. In addition, the need for a margin of safety is greater in this situation, because the Hemlock Mutual Water Company's well water has not been fully characterized.

To upgrade Hemlock's carbon system to the recommended capacity based upon accepted engineering design criteria would require the installation of two additional carbon vessels each with a contact volume of 150 cubic feet. It is estimated that the design and installation of these supplemental vessels would cost approximately $210,000, which is considerably more expensive than installing an air-stripping system at Hemlock.

COMMUNITY RELATIONS

Selection of an IRM for San Gabriel Area 1 is different from other typical Superfund remedial actions in that implementation of any alternative requires formal approval by the affected mutual water companies through a shareholders' vote. Community relations is always important at Superfund sites, but in this case, where there is a need for formal approval by the affected "community", it takes on added importance.

The final draft "Focused Feasibility Study, San Gabriel," was made available to the public on December 13, 1983. Copies of the report were distributed to California DOHS, the San Gabriel Management and Technical Advisory Committees, as well as directly to the three mutual water companies affected. Three repositories were established: 1) El Monte Public Library in El Monte; 2) Norwood Public Library in El Monte; and 3) EPA Region IX Library in San Francisco. A press release was issued by Region IX and public notices were published in the Intercity Express (El Monte), and the San Gabriel Valley Daily Tribune (West Covina) announcing the availability of the report, the repository locations, the public comment period of December 13 through December 30, 1983, and the public meeting on the report, scheduled by EPA for December 19, 1983.

The public meeting was held at the Arroyo High School in El Monte. Less than ten members of the public attended; no individuals in attendance chose to make an oral statement. Before the public meeting, a briefing was held for members of the governing boards of the three mutuals. During the briefing, the results of the focused feasibility study were presented and the decision-making process was explained.

EPA received two written comments during the public comment period. In general, one commentor supported alternative D—join with another water system—as the most cost-effective solution. The other commentor supported ground water treatment alternatives over those that developed alternative water supplies for the mutuals. In addition, the commentor favored carbon adsorption treatment over air-stripping, because of concern over the potential air pollution impacts. EPA's response to these comments is summarized in the attached responsiveness summary.

Due to the lack of input provided by the public comment period, EPA decided to go directly to the mutuals' shareholders for their views. This was necessary because of the requirement that the shareholders vote on any selected IRM. A brief fact sheet summarizing the results of the focused feasibility study was prepared. The fact sheet was sent to the governing boards of the three mutuals for distribution to their shareholders (the governing boards did not want EPA to send the fact sheets directly). The fact sheet clearly stated that EPA's recommendation was the air-stripping treatment alternative, but that EPA would also approve alternative D—join with another water system—since it was lower in cost and would be equally effective in protecting public health. EPA requested that the mutuals provide us with input as to which alternative they would accept.

Rurban Homes Mutual Water Company held its annual shareholders' meeting on February 5, 1984. During the meeting the proposed IRM was discussed. The discussion centered on the carbon adsorption and air-stripping alternatives. The shareholders voted to recommend that EPA select the carbon adsorption alternative. A telephone conversation with a member of the governing board indicated that the decision was based primarily on concern over the potential for air pollution with the air-stripping alternative, the difficulty of obtaining an air emission permit, and interest generated by the carbon adsorption system purchased by the Hemlock mutual. Rurban Homes indicated that its members definitely were not willing to dissolve and join another water system. The results of the meeting were conveyed to EPA in a letter (see attached responsiveness summary).

Hemlock and Richwood Mutual Water Companies did not schedule a shareholders' meeting to discuss the IRM. The fact sheets were sent to all shareholders, and the general view of the mutuals' members was obtained through discussions with a portion of the membership. A board member of the Hemlock mutual indicated that the choice of most of Hemlock's shareholders was to select carbon adsorption treatment, particularly since they had already purchased a carbon filter system. It was indicated that Hemlock definitely did not want to dissolve and join another water system.

A board member of the Richwood mutual indicated that of the mutual shareholders contacted, the majority preferred the air-stripping alternative and did not want the mutual to dissolve. A few shareholders requested that the governing board of the mutual call a shareholders' meeting to take a formal vote on the alternatives.

RECOMMENDED ALTERNATIVE

Section 300.68(j) of the National Oil and Hazardous Substances Contingency Plan (NCP) (47 FR 31180, July 16, 1982) states that the appropriate extent of remedy shall be determined by the lead agency's selection of the remedial alternative which the agency determines is cost-effective (i.e., the lowest cost alternative that is technologically feasible and reliable, and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, and the environment). Based on our evaluation of the cost-effectiveness of each of the proposed alternatives, the comments received from the public, and information received from the State, EPA staff recommends the installation of an air-stripping treatment system for the Richwood, Rurban Homes, and the Hemlock Mutual Water Companies.

Five alternatives were found to be equally effective in minimizing the public health threat posed by the mutuals' contaminated well-water. Of these alternatives, the lowest-cost alternative, E.2—obtain water from a nearby purveyor, mutuals lease water rights—had to be dismissed from consideration because no nearby water company was identified that would be willing to participate in such an arrangement.

Alternative D—join with another water system—was the next lowest -cost alternative. This alternative was not recommended in the feasibility study because it would require dissolution of the mutuals, and there was no indication at that time that the mutuals were willing to dissolve. When the results of the focused feasibility study were presented to the mutuals, Hemlock and Rurban Homes indicated that they were definitely not interested in dissolving. In addition, the majority of the shareholders of the Richwood mutual that were contacted did not want the mutual to dissolve. In response to this public input, EPA staff is not recommending this alternative as the IRM selection. Moreover, implementing this alternative without the mutuals' consent would necessitate condemning their water rights, which would significantly increase the cost of this alternative.

Of the remaining most-effective alternatives, water treatment by air-stripping is by far the lowest-cost alternative. It is less than half the cost of the next lowest-cost alternative—treatment with a carbon adsorption system. Consequently, EPA staff recommends this alternative as the most cost-effective alternative for the Richwood, Rurban Homes and Hemlock Mutual Water Companies.

Richwood Mutual Water Company indicated to EPA that the majority of the shareholders contacted approved of the EPA's recommendation of treatment of contaminated water with an air-stripping system as the most cost-effective alternative.

Rurban Homes Mutual Water Company indicated to EPA that it prefers the carbon treatment alternative. The carbon treatment alternative for Rurban Homes is estimated to have a capital cost of $568,000 and five-year present worth O&M cost of $40,000, resulting in a total five-year cost of $608,000. In contrast, the total cost for an air-stripping treatment system is $277,000 — $211,000 in capital costs and $66,000 in five-year present worth O&M costs. Since the air-stripping alternative was judged to be only negligibly less effective than carbon adsorption while still providing adequate protection to public health and the environment, EPA staff believes that the extra cost for the carbon adsorption system is not justified.

Hemlock Mutual Water Company also indicated that it prefers the carbon treatment alternative. Hemlock is in a different situation since it has already purchased a carbon filter system. A CH2M Hill analysis for EPA judged this purchased system to be underdesigned. The cost to upgrade this system to include the margin of safety based on accepted engineering design criteria was estimated to be $210,000. With the five-year present worth O&M cost for carbon treatment of Hemlock's well-water estimated to be $67,000, the total five-year cost to upgrade Hemlock's purchased carbon filter system would be $277,000. This is well above the total five-year cost for the air-stripping alternative of $182,000--$141,000 in capital costs and five-year present worth O&M costs of $41,000. In addition, it could be difficult to retrofit Hemlock's purchased system due to the limited land available at Hemlock's well site. An air-stripping system, however, could be accommodated at the site. Therefore, EPA staff also recommends air-stripping treatment of ground water as the most cost-effective IRM for the Hemlock Mutual Water Company.

In summary, the recommended cost-effective IRM for the three mutual water companies is installation of an air-stripping system to treat contaminated ground water from the wells of each of the mutual water companies. The costs associated with this alternative are summarized in the following table:

MUTUAL WATER COMPANY	DESIGN & CONSTRUCTION COSTS	5-YEAR O&M COSTS	TOTAL 5-YEAR COST
Richwood	$173,000	$50,000	$223,000
Rurban Homes	$211,000	$66,000	$277,000
Hemlock	$141,000	$41,000	$182,000
TOTAL	$525,000	$157,000	$682,000

EPA will request all three mutuals to schedule shareholders meetings, at which EPA will explain its decision to the mutuals. Also, the Agency will assure the mutuals that EPA and the State will have the responsibility to obtain any permits that EPA determines are necessary, and will work with the South Coast Air Quality Management District to ensure that there are no serious air pollution impacts associated with implementation of the air-stripping alternative.

At that time, Rurban Homes and Hemlock Mutual Water Companies will be informed that if they do not approve the air-stripping alternative, and insist on obtaining a carbon adsorption treatment system, EPA will implement the carbon adsorption treatment alternative if the mutuals pay the difference between the cost of the carbon adsorption system and the estimated cost of the air-stripping treatment alternative. In addition, EPA acknowledges that the approval of the air-stripping alternative by the Richwood mutual was based on

the input of a limited number of the shareholders of that mutual. Therefore, if the Richwood mutual's shareholders vote to dissolve at a shareholder's meeting, EPA will implement alternative D—join with another water system—since it is lower in cost than the air-stripping alternative and has been judged equally effective in protecting the public health.

OPERATION AND MAINTENANCE (O&M)

The recommended action will involve operation and maintenance (O&M) activities to ensure its continued effectiveness. The O&M will involve operating the air-stripping systems for the five-year period estimated to complete the long-term remedy. The estimated present worth of the five-year O&M costs are shown above. The State has requested funding for the first year of systems operation. These estimated costs are shown below:

Mutual Water Company	Estimated One-Year O&M Cost
Richwood	$12,000
Rurban Homes	$16,000
Hemlock	$10,000
TOTAL	$38,000

The California DOHS will be responsible for O&M during the period of operation. The State will require the Mutuals to contribute to the cost of continued O&M activities.

SCHEDULE

- Regional Administrator Approves IRM (signs ROD)	May 10, 1984
- Authorization to CH_2M Hill to Prepare IRM Design	May 17, 1984
- Begin Design of IRM	May 24, 1984
- Award Superfund State Contract for IRM Construction	July 1984
- Begin Construction of IRM	August 1984
- Complete Implementation of IRM	December 1984

FUTURE ACTIONS

The State and EPA will conduct a long-term RI/FS project to identify the extent of ground water contamination in all four San Gabriel areas. Alternatives to achieve long-term mitigation of the area-wide contamination will be evaluated. The RI/FS is scheduled to start in May 1984. An additional ROD will be prepared at the conclusion of the project.

ADDENDUM

This Record of Decision Package was prepared and sent from EPA Region 9 to EPA Headquarters in February. This addendum summarizes events that have taken place since then which affect the proposed San Gabriel IRM.

EPA Region 9 staff held a meeting for shareholders of the three mutuals on March 8, 1984, to discuss EPA's recommended alternative and request that the shareholders take a formal vote to approve the measure. At that time, EPA informed the mutuals that EPA will implement the carbon adsorption alternative if they pay EPA for the difference in cost over the air-stripping system. In addition, if the mutuals' shareholders voted to dissolve in a formal meeting, EPA will implement the alternative under which the mutuals would join another water system since it is lower in cost than the air-stripping alternative and equally effective in protecting the public health. A fact sheet summarizing the mutuals' options was distributed to the mutuals' shareholders prior to the meeting.

Rurban Homes Mutual Water Company conducted a door-to-door poll of its membership in March, while the Richwood and Hemlock Mutual Water Companies held shareholders' meetings. Rurban Homes and Richwood Mutual Water Companies agreed to accept the recommended alternative—installation of air-stripping treatment systems. The shareholders of the Hemlock Mutual Water Company voted to request no action on the part of EPA and to continue with the implementation of their purchased carbon adsorption system. Therefore, approval of this Record of Decision will allow EPA to install air-stripping treatment systems for the Rurban Homes and Richwood Mutual Water Companies.

ble 1

SAN GABRIEL AREA 1
INITIAL REMEDIAL MEASURES ANALYSIS

EFFECTIVENESS EVALUATION

	Criterion							
Weighting Factor:	3	4	3	2	4	3	5	
Alternative	(1) Time	(2) Reliability of Equipment	(3) Operational Complexity	(4) Permanence	(5) Institutional Complexity to Implement	(6) Community Impact	(7) Risk of Failure	TOTAL SCORE
C. Provide Bottled Water	5	4.5	4.5	1	4	1	5	92.5
D. Join With Another Water System	2	5	5	5	2	3	5	93
E. Obtain Water From A Nearby Purveyor	4	5	5	4.5	1	3	5	94
F. Connect to Metropolitan Water District	1	5	5	4.5	3	3.5	5	94.5
G. Use Home Treatment Devices	5	2	3	2	2	2	2	60
H. Treatment With A Carbon Adsorption System At Well Discharge	5	4	3	4	4	4	4	96
I. Treatment With An Air-Stripping	5	4	3	4	3.5	4	4	94

Note: Scores were based on a range of 1 to 5 with 5 indicating the best rating.

TABLE 2

SAN GABRIEL AREA 1
INITIAL REMEDIAL MEASURES ANALYSIS

COST OF ALTERNATIVES

Alternative	Capital Costs	5-Year Operation & Maintenance	5-Year Increased Water Costs	Total 5-Year Costs
C. Bottled Water	-	$9,594,000	-	$9,594,000
D. Join with Another Water System	$ 190,000	-	$316,000	506,000
E. Obtain Water from Nearby Purveyor				
1. Mutuals Maintain Rights	51,000	-	960,000	1,011,000
2. Mutuals Lease Rights	51,000	-	401,000	452,000
F. Connect to Metropolitan Water District	1,236,000	50,000	348,000	1,634,000
H. Treat Well Discharge with Carbon Adsorption System	1,270,000	140,000	-	1,410,000
I. Treat Well Discharge with Air Stripping System	525,000	157,000	-	682,000

ISSUES AND RESOLUTIONS	KEY WORDS
2. Releases of ground water contaminants (i.e., organic solvents) to the atmosphere as a result of remedial technologies such as air-stripping should be evaluated to ensure that a public health threat is not being transferred from one media to another. A permit is not required for these air releases under current EPA policy. However, technical requirements of the air program should be followed. Although the site was in a non-attainment area, air emissions from this facility do not pose a public health threat locally and do not measurably contribute to area-wide air contamination.	. Air Quality . Air Permit
3. The lowest cost alternative for this site was dismissed from further consideration because nearby water companies were not willing to lease water rights from the affected mutuals. The second lowest cost alternative was also dismissed because it involved dissolution of the water mutuals. Of the remaining alternatives, water treatment by air stripping was the most cost-effective alternative. Two of the water mutuals supported a carbon adsorption treatment alternative. One mutual indicated a preference for carbon adsorption treatment and the other was already treating water with a carbon adsorption system. It was determined that the operating carbon adsorption system was underdesigned and it would be considerably more expensive to upgrade than to install an air-stripping system. EPA has decided that the extra cost for the carbon adsorption system was not justified since the air stripping alternative is negligibly less effective.	. Carbon Adsorption . Air Stripping
4. ROD briefings should contain the most recent and historical data (e.g. analytical) so that contaminant migration and contamination levels can be analyzed.	. Data Adequacy . Trend Analysis

RECORD OF DECISION

Initial Remedial Measure Alternative Selection

SITE: San Gabriel Area 1, El Monte, California

DOCUMENTS REVIEWED

I have reviewed the following documents describing the analysis of cost-effectiveness of Initial Remedial Measure alternatives for the San Gabriel Area 1 Site:

- Study entitled "Draft Focused Feasibility Study, San Gabriel, San Gabriel Basin, Los Angeles County, California, December 6, 1983."
- Staff summaries and recommendations, including the Record of Decision Briefing Paper and the Summary of Initial Remedial Measure Alternative Selection.
- CH2M Hill's analysis of the Hemlock Mutual Water Company's carbon adsorption system.
- Public Participation Responsiveness Summary.

DESCRIPTION OF SELECTED INITIAL REMEDIAL MEASURES

- Installation of three individual packed tower air-stripping treatment systems for the Richwood, Rurban Homes, and Hemlock Mutual Water Companies.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Oil and Hazardous Substances Contingency Plan (40 CFR Part 300), I have determined that the installation of water treatment systems for the Richwood, Rurban Homes, and Hemlock Mutual Water Companies at the San Gabriel Area 1 Site is a feasible and cost-effective remedy necessary to limit exposure or threat of exposure to significant health or environmental hazard. In addition, the action will require future operation and maintenance activities to ensure the continued effectiveness of the remedy. Those activities will be considered part of the approved action and eligible for Trust Fund monies for a period of one year after start of operation.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites.

In addition to this action, EPA and the State will conduct a long-term remedial investigation and feasibility study to identify the appropriate remedy to the area-wide ground water contamination. I will make a future determination concerning any additional remedial actions following completion of that study.

John Wise

for Judith E. Ayres
Regional Administrator
EPA Region IX

5.11.84
Date

SUMMARY OF INITIAL REMEDIAL MEASURE ALTERNATIVE SELECTION

SAN GABRIEL AREA 1 SITE
EL MONTE, CALIFORNIA

SITE LOCATION AND DESCRIPTION

The San Gabriel Area 1 site is one of four plumes of ground water contamination that have been found in the San Gabriel ground water basin. This ground water basin is located within the San Gabriel Valley in the northern part of Los Angeles County, California. The valley is bounded to the north by the San Gabriel Mountains. A series of low (500 feet) hills—the San Rafael, Repetto, Merced, Puente, and San Jose Hills—form the western, southwestern, southern, and southeastern boundaries of the valley. The major land uses in the valley are residential and commercial/light industrial.

San Gabriel Area 1 site is a northeast to southwest trending plume of ground water contamination approximately 4 miles long and 1 1/2 miles wide. It is located along the axis of the Rio Hondo and Salt Pit Washes, and parallels the San Gabriel River to the east. It lies primarily beneath the cities of El Monte and Monrovia.

The San Gabriel Valley receives approximately 15-20 inches of annual precipitation. Surface water drains southward through the valley through the Whittier Narrows, a 1.5-mile wide syncline between the Merced and Puente Hills.

The San Gabriel ground water basin that underlies the valley is a major source of ground water. The depth of the ground water varies widely from approximately 25 to 300 feet below the surface, depending on the location within the basin. The major ground water flow in the basin originates in the Santa Fe Flood Control Basin area and generally follows the southward pattern of surface drainage in the valley toward the Whittier Narrows. The San Gabriel basin has been heavily developed over the years, resulting in considerable change to the patterns of ground water movement. Water rights in the basin were adjudicated in 1954. Forty-six water purveyors operate in the basin and provide drinking water for an estimated 700,000-1,000,000 people, as well as water for industrial uses. The basin's water supply is replenished through controlled recharge areas.

Large areas of the San Gabriel basin have been found to be contaminated with chlorinated hydrocarbons. This contamination was first observed in December 1979, when samples taken by Aerojet Electrosystems Company in Azusa, California were found to contain 1800 parts per billion (ppb) of trichloroethylene (TCE). Subsequent testing of nearby wells by the California Department of Health Services (DOHS) found TCE contamination in 3 additional wells. An extensive well-water testing program was begun by DOHS which found large areas of the basin contaminated with TCE, tetrachloroethylene (PCE), and other chlorinated hydrocarbons.

Based on existing water quality data from the DOHS testing program, it appears there are several distinct plumes of contamination in the basin. San Gabriel Area 1 is the site of one of these plumes. The ground water in this plume has been found to contain PCE, TCE, and carbon tetrachloride. Many of the public wells in this area are contaminated with levels of PCE

EPA and California DOHS have made a decision that they would not recommend it, although they consider it to be a viable alternative. If the mutuals indicated that they would be willing to accept dissolution EPA and DOHS would support this alternative since it is lower in cost than the air-stripping treatment alternative and has been judged to be equally effective in protecting the public health.

While the initial remedial measure should be relatively compatible with the ultimate long-term remedy in the basin, the focus of analysis is to find a solution that will be adequate during the interim period before a final solution is in place.

Of all the other viable alternatives found to be equally effective in minimizing the potential public health threat, air-stripping is by far the lowest-cost alternative. The air-stripping option is less than half of the cost of the carbon adsorption alternative.

EPA acknowledges that concern has been expressed over the potential exposure to PCE caused by air emissions from the air-stripping treatment system. To estimate the impact of these emissions, EPA staff performed a worst-case analysis of the exposure levels of PCE that could result from the estimated emissions of the air-stripping systems. In this analysis, an estimate was made of the increased risk of contracting cancer due to inhalation of ambient levels of PCE that would result from emissions from air-stripping towers installed at the three mutuals. The analysis showed that the level of risk due to air emissions would be a few orders of magnitude below the level of increased cancer risk that would result from ingesting water contaminated with PCE at a concentration equal to the State Action Level--a level which California DOHS has determined to be a safe level for human consumption. The details of this analysis are available upon request from the EPA Region 9 office.

The estimated emissions from air-stripping towers at all three mutuals under a worst-case situation would be 145 pounds per year based on the mutuals' annual water use, the highest concentration of PCE found in each mutuals' wells during the last three years, and assuming that air-stripping removes all of the PCE found in the treated water. Based on current contamination levels in the mutuals' wells, the estimated emission rate would be only 60 pounds per year.

During preparation of the focused feasibility study report, discussions were held with the South Coast Air Quality Management District (SCAQMD), which would have to approve the air-stripping treatment alternative. SCAQMD indicated that air quality modeling of the system with respect to dispersion of waste gases would be required. Modeling studies would produce a better estimate of the annual average increase in ambient PCE concentration than the worst-case analysis described above. These studies could also be used to set the overall height of the stack of the air-stripping system. SCAQMD indicated that the mass of pollutants expected to be discharged was relatively small compared to other discharges of these contaminants to the atmosphere.

In summary, EPA believes that the air pollution impact of the proposed air-stripping system will be minimal, and that the additional cost of the carbon adsorption treatment system is not justified.

EPA Region 9 will work with the SCAQMD to ensure that there are no serious air pollution impacts associated with the implementation of the air-stripping treatment alternative.

Specific Comments and Responses

In addition to the major comments reviewed above, other comments were received as follows:

- One commentor noted that the executive summary of the focused feasibility study refers to an Action Level of 8 ppb for PCE, although the State DOHS Action Level is 4 ppb.

  The commentor is correct: The State Action Level is 4 ppb. Although the body of the report refers to the 4 ppb Action Level for PCE, a mistake was made in the Executive Summary. Correcting this error, however, would not change any of the substantive statements made in the report.

- The president of the San Gabriel Valley Water Company disputed the inclusion of a $17,000 connection charge for each mutual in the cost estimate for alternative D—joining with another water system. He states that the only cost to the mutuals if alternative D is selected would be an estimated charge of $200 per residence for connection to a water meter. San Gabriel Valley Water Company would pay for the connections between the systems.

  EPA acknowledges that the $17,000 connection charge per mutual may not be assessed by the San Gabriel Valley Water Company if alternative D is selected. In choosing the most cost-effective alternative, however, EPA considers the total cost of implementation of the alternatives, not just those costs that would be paid by EPA, the State, or the mutuals. Thus, the costs EPA would pay, such as capital costs of installation, and the costs EPA would not pay, such as operation and maintenance costs, are added together to yield the total cost on which the decision is based. In the case of alternative D, while EPA may not be required to pay for the connection between the water mains of the mutuals and the San Gabriel Valley Water Company, the costs will have to be paid by someone if this alternative is implemented. Therefore, it should be added to other costs associated with this alternative to yield the total cost. The $17,000 cost figure is based on the simple pipeline connection between the mutuals' and San Gabriel Valley Water Company's distribution systems described in alternatives E.1 and E.2. This cost figure was used even though the cost for the more elaborate connection of water systems that would most likely be used if alternative D was implemented would probably be much higher.

  In addition, even if these costs were deleted from the cost estimate for alternative D, it would not change the ranking of the alternatives in terms of cost and, therefore, would not alter the substantive conclusions of the focused feasibility study.

- One commentor noted that the 6 month Operation and Maintenance (O&M) costs shown in the cost summaries for alternatives H and I—carbon adsorption treatment and air-stripping treatment, respectively-appear not to include the additional labor for operating and maintaining the

SAN GABRIEL AREA 1

Responsiveness Summary

Focused Feasibility Study Final Draft

Background

Large areas of the San Gabriel groundwater basin, Los Angeles County, California, have been found to be contaminated with chlorinated hydrocarbons. San Gabriel Area 1, a plume of groundwater contamination located primarily underneath the city of El Monte, was included in EPA's proposed update to the National Priorities List issued September 8, 1983.

In 1980, the State of California began an extensive well water testing program in the San Gabriel basin which found numerous wells contaminated with trichloroethylene (TCE), tetrachloroethylene (PCE), and other chlorinated hydrocarbons. The California Department of Health Services (DOHS) directed public water companies in the area to periodically test their wells. State Action Levels for TCE and PCE were set at 5 and 4 parts per billion (ppb), respectively, based on the Environmental Protection Agency's (EPA) Suggested No Adverse Response Level (SNARL). If alternative methods of reducing PCE and TCE concentrations below the Action Levels (such as blending waters from different wells) are not effective, wells must be removed from service.

Currently, there are three mutual water companies-Richwood, Rurban Homes, and Hemlock--that have no alternative water supply and have been providing their customers with water that is contaminated with PCE at concentrations above the DOHS Action Level.

In May 1983, a management committee comprised of EPA, various state and local agencies, and representatives of various water companies and public interest organizations was established with California DOHS as its chair. The objectives of this committee are: 1) to find a solution for the three mutual water companies that have a well contamination problem and have no alternative water supply; 2) to identify and control any TCE/PCE sources; and 3) to develop an overall strategy for management of the plume areas.

To address this first objective, EPA directed its contractor, CH2M Hill, to evaluate alternative initial remedial measures (IRM) to solve the mutuals' water contamination problems during the interim period before a final long-term solution to groundwater contamination in the San Gabriel basin is implemented. CH2M Hill prepared a focused feasibility study that evaluated the cost-effectiveness of various IRM alternatives. This study recommended the installation of a packed tower air-stripping treatment system as the most cost-effective alternative. This system would treat the mutuals' well-water to reduce the concentration of PCE to below the DOHS Action Level before it is distributed to their customers.

A lower-cost alternative, under which the mutuals would dissolve and become part of another water system, was determined to be equally effective in minimizing the potential threat to public health. This alternative was not recommended, however, because the dissolution of the mutuals would require a shareholders' vote. EPA and California DOHS decided not to recommend this alternative in

the absence of any indication by the mutuals that it would be acceptable to them, but the agencies consider dissolution of the mutuals to be a viable option.

The final draft "Focused Feasibility Study, San Gabriel", was made available to the public on December 13, 1983. Copies of the report were distributed to California DOHS, the San Gabriel Management and Technical Advisory Committees, and directly to the three mutual water companies affected. Three repositories were established: 1) El Monte Public Library in El Monte; 2) Norwood Public Library in El Monte; and 3) EPA Region 9 Library in San Francisco. A press release issued by Region 9 and public notices published in the Intercity Express (El Monte), and the San Gabriel Valley Tribune (West Covina) announced the availability of the report, the repository locations, the public comment period of December 13 through December 30, 1983, and the public meeting on the report scheduled by EPA for December 19, 1983. The public meeting was held at Arroyo High School in El Monte. Before the public meeting, a briefing was held for members of the governing boards of the three mutuals. During the briefing, the results of the focused feasibility study were presented and the decision-making process was explained.

Less than ten members of the public attended the Decemer 19th public meeting; no individual in attendance chose to make an oral statement. EPA received two written comments during the public comment period. A list of commentors, copies of the written statements, and a transcript of the public meeting is attached.

Comments

In terms of which alternative initial remedial measure was supported, the two comments can be summarized as follows; a later section will discuss specific comments regarding the focused feasibility study.

One commentor supports the selection of the alternative under which the mutuals would dissolve and join another water company as the most cost-effective alternative; and

One commentor supports contaminated water treatment alternatives over alternatives that provide another source of water supply for the residents of the three mutuals, because treatment methods remove contaminated water from the basin thereby adding to the long-term solution of the groundwater contamination problem. In addition, this commentor strongly objects to air-stripping as a treatment method because of the potential public health threat of exposure to contaminants via air emissions. This commentor supports the use of a carbon treatment system as the best treatment method, instead of air-stripping.

Response

It is the recommendation of EPA and the California Department of Health Services (DOHS) that treatment of contaminated water with an air-stripping treatment system be selected as the initial remedial measure for the Richwood, Rurban Homes, and Hemlock Mutual Water Districts. Joining with another water system would require dissolution of the mutuals by a shareholders' vote. In the absence of any indication by the mutuals that they would accept this alternative,

3-14-87

SAN GABRIEL AREA 1

RECORD OF DECISION BRIEFING

DRAFT

PURPOSE

- To obtain the Assistant Administrator's approval for initial remedial measures at the San Gabriel Area 1 site in El Monte, California. The initial remedial measure recommended by EPA Region IX and the California Department of Health Services (DOHS) is the installation of packed tower air-stripping systems at the wells of three mutual water companies to treat ground water contaminated with tetrachloroethylene.

ISSUES OF CONCERN

- The three mutual water companies affected by the IRM have recommended an alternative that is more costly than the cost-effective alternative. The mutuals must approve the IRM through a shareholder vote. One or more mutuals may vote to install a more expensive alternative than that approved by EPA.

BACKGROUND

- San Gabriel Area 1 is one of four plumes of ground water contamination located in the San Gabriel ground water basin that are on the Proposed National Priorities List. The San Gabriel basin is an important source of ground water located underneath the San Gabriel Valley, about 40 miles east of Los Angeles. The basin covers an area of approximately 700,000 to 1,000,000 people, as well as water for industrial uses.

- Contamination was discovered in December 1979, when Aerojet Electrosystems in Azusa analyzed samples taken from a municipal water supply well adjacent to the Aerojet property. Samples showed trichloroethylene (TCE) concentrations of 1800 parts per billion (ppb).

- This discovery prompted a joint State/local sampling program in the entire basin and outlying areas. As of now, sampling in the basin has found 56 wells contaminated with TCE, tetrachloroethylene (PCE), and other chlorinated solvents.

- Based on existing data, it appears that there are several distinct plumes of ground water contamination in the basin.

- DOHS has set Action Levels for TCE and PCE of 5 and 4 ppb, respectively. These levels are based on the EPA suggested No Adverse Response Levels (SNARL) and represent the levels at which the risk of contracting cancer due to the ingestion of drinking water contaminated with TCE or PCE is 10^{-6}.

DRAFT

- Currently, there are three mutual water companies — Richwood, Rurban Homes, and Hemlock - that have no alternative water supply and have been providing their customers with water that is contaminated with PCE at concentrations above the DOHS Action Level. Mutual water companies are cooperatively owned water companies; in other words, the customers own shares in the company. These three mutuals serve approximately 700 households with drinking water. The most recent sampling data shows the following PCE concentrations in the mutuals' wells:

  Richwood: Well No. 1 — 62 ppb; Well No. 2 — 92 ppb
  Hemlock: South Well — 50 ppb; North Well — 38 ppb
  Rurban Homes: Well No. 1 — 1.7 ppb; Well No. 2 — 3.7 ppb

- Although Rurban's Homes' well - water presently meets the Action Level, this is the first sampling episode in which the wells have had concentrations of less than 4 ppb PCE since contamination was first detected in October 1980.

- EPA considered Emergency Action to meet the first objective, however, this was rejected because the levels of TCE and PCE in the mutuals' wells did not exceed the 10-day health advisory. This objective is now being addressed by the initial remedial measures described in this briefing.

ENFORCEMENT

- At Region IX's request, the Field Investigation Team (FIT) has prepared a list of Potentially Responsible Parties (PRP's) for use in preparing RCRA Section 3007/CERCLA Section 104 letters.

- The Region sent 16 section 3007/104 letters to PRP's on August 19, 1983, after FIT provided an initial list of PRP's. This list was based on the 1980 RWQCB study and, therefore, included only two facilities in Area 1. When the final FIT list was provided, the Region sent 72 additional section 3007/104 letters on January 12, 1984; 31 of these PRP's were located in Area 1.

- Region IX staff are reviewing responses to these letters as they are received to identify candidates for site inspections and further investigations. Four of the initial list of 16 PRP's have been referred to FIT for site inspections, however, none of these facilities are located in Area 1.

- Since evidence linking specific responsible parties to ground water contamination in Area 1 has not yet been produced, Administrative Orders cannot be used to compel implementation of the IRM. Therefore, it is recommended that Trust Fund monies be used for IRM implementation.

DRAFT

RESULTS OF THE FOCUSED FEASIBILITY STUDY

- Seven IRM alternatives were evaluated in detail as to their effectiveness and cost in the focused feasibility study:

  Alternative C - Bottled water

  Alternative D - Join with another water system

  Alternative E.1 - Obtain water from a nearby purveyor, mutuals maintain water rights

  Alternative E.2 - Obtain water from a nearby purveyor, mutuals lease water rights

  Alternative F - Connect to the Metropolitan Water District

  Alternative H - Treat well discharge with carbon adsorption system

  Alternative I - Treat well discharge with air-stripping system

- Costs and effectiveness scores for these seven alternatives are shown in Table 1. All seven of these alternatives that received final consideration were considered to be equally effective in meeting the objective of the IRM. Therefore, the final decision was based on cost.

- Alternative E.1 and E.2 had to be dropped from further consideration because no nearby water purveyor was identified that would provide water under either of those alternatives.

- Alternative D, was the next lowest cost alternative after E.1. It was not recommended as the cost-effective alternative because it would require dissolution of the mutuals. At the time the focused feasibility study was prepared, there was no indication that the mutuals would be willing to dissolve.

- Alternative I - treatment with air-stripping system -- was recommended as the most cost-effective alternative since it was the lowest cost of the remaining alternatives, and was judged to be equally effective in protecting public health.

COMMUNITY RELATIONS

- Rurban Homes held a shareholders' meeting; a majority of those shareholders in attendance voted to recommend that EPA select the carbon adsorption alternative. Rurban Homes members were definitely not interested in dissolving the mutual. The decision was based on concern over the potential air pollution impact of air-stripping towers, difficulty in obtraining an air emissions permoit, and interest generated over Hemloc's purchase of an carbon filter system.

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- Hemlock and Richwood Mutual Water Companies did not schedule shareholders' meetings. The general view of the shareholders was obtained through discussions with a portion of their members. A Hemlock board member indicated that the choice of most of Hemlock's membership was to select carbon adsorption. The majority of the Richwood shareholders contacted preferred the air-stripping alternative.

RECOMMENDATION OF THE COST-EFFECTIVE INITIAL REMEDIAL MEASURE

- EPA Region IX and California DOHS recommend that installation of an air-stripping treatment system be selected as the most cost-effective solution. The lowest cost alternative - obtain water from a nearby purveyor, mutuals lease water rights - cannot be implemented because no water purveyor has been identified that would participate in such an arrangement. Although the next lowest cost alternative is for the mutuals to join with another water system, none of the mutuals has indicated a willingness to dissolve as would be required under this alternative. Therefore, in response to public input, the Region and DOHS do not recommend the selection of this alternative. Of the remaining alternatives, air-stripping treatment is by far the lowest cost. In addition, it has been judged to be as equally effective in protecting the public health and welfare as any of the other alternatives.

- Although Rurban Homes prefers the carbon adsorption alternative, this option is over twice the cost of air-stripping. To address their concerns over the potential for air pollution, Region staff prepared a worst case analysis of the potential air pollution impacts. Based on this analysis and CH2M Hill's discussions with the South Coast Air Quality Mangement District (SCQMD), the Region has determined that the air pollution impact of air-stripping towers installed at the three mutuals' well sites will be negligible. In addition, EPA will comply with all rules and procedures of the SCAQMD in implementing this alternative.

- Hemlock's situation is slightly different from that of Rurban Homes in that they have already installed a carbon treatment system. A CH2M Hill analysis of the design of this system prepared at the request of Region IX concluded that this sytem was underdesigned and lacking a proper margin of safety. Upgrading this system to the design standards based on accepted engineering design criteria was estimated to cost $210,000. Therefore, the total costs of a retrofit of their system would be almost $100,000 more than the air-stripping system. Consequently, the Region and California DOHS recommend the installation of the air-stripping system for the Hemlock mutual as well.

- EPA met with shareholders from the three mutuals on March 8, to discuss EPA's recommended alternative and request that the shareholders take a formal vote to approve the measure. At that time, EPA informed the mutuals that EPA will implement the carbon adsorption alternative if they pay EPA for the difference in cost over air-stripping. In addition, EPA acknowledges that a significant fraction of Richwood's members preferred to dissolve. Therefore, if the membership votes to dissolve in a formal meeting, EPA will implement the alternative under which Richwood would join another water system since it is lower in cost than the air-stripping alternative and equally effective in protecting the public health.

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FUTURE REMEDIAL ACTIONS

- A RI/FS in the San Gabriel basin will begin in April 1984, to determine the extent of ground water contamination and to recommend cost-effective long-term remedial action for San Gabriel Areas 1 through 4. It is estimated that the RI/FS may take three years to complete, and that the final remedial action will not be in place until five years from now.

NEXT STEPS

° San Gabriel Area Sites are added to NPL (final)	March 30, 1984
° Assistant Administrator Approves IRM (signs ROD)	March 30, 1984
° Award Superfund State Contract for Implementation of IRM	April 6, 1984
° Begin Design and Construction of IRM	April 1984
° Complete Implementation of IRM	October 1984

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TABLE 1

SAN GABRIEL AREA 1

RECORD OF DECISION BRIEFING

COST-EFFECTIVENESS EVALUATION

	Capital Costs	5-Year Present Worth Annual Costs	Total 5-Year Costs	Total Effectiveness Score
C. Bottled Water	-	$9,594,000	9,594,000	92.5
D. Join with Another Water System	190,000	316,000	506,000	93
E. Obtain Water from Nearby Purveyor				
1. Mutuals Maintain Rights	51,000	960,000	1,011,000	94
2. Mutuals Lease Rights	51,000	401,000	452,000	94
F. Connect to Metropolitan Water District	1,236,000	398,000	1,634,000	94.5
H. Treat Well Discharge with Carbon Adsorption System	1,270,000	140,000	1,410,000	96
I. Treat Well Discharge with Air-Stripping System	525,000	157,000	682,000	94

treatment facilities. Specifically, it is mentioned that under current California Department of Health Services (DOHS) regulations, a Water Treatment Operator Certificate would be required for any employee to operate the system. If the mutuals do not currently employ individuals with the required certificate, additional labor costs should be included under O&M costs for these alternatives.

This point was discussed with staff in the Sanitary Engineering Section of the California DOHS office in Los Angeles. Specifically it was asked how this regulation would affect the implementation of the water treatment alternatives. DOHS staff stated that while under the regulations, the operator would have to have the required Water Treatment Operators Certificate, DOHS would in all likelihood allow the mutuals to operate the treatment systems in the interim as long as the operator was undergoing training provided by either the system vendor or through some other source. Therefore, EPA feels the estimates of O&M costs provided in the focused feasibility study are reliable. The labor costs are based on an estimated 32 hours per month of part-time labor charged at $15/hour. During the first 6 months of operation, there would be no charges for carbon replacement under alternative H--treatment with a carbon adsorption system--since the system will be installed with fresh carbon at full capacity.

- One commentor stated that the implementation of water treatment system alternatives for the mutuals is necessary to attempt restoration of the damaged groundwater resource and to prevent further spread or movement of the contaminant plume to other groundwater resources.

EPA believes that not enough information regarding the vertical and horizontal distribution of contamination in the San Gabriel basin is available to state with certainty whether any specific action will stop or encourage migration of the contaminant plume. Similarly, the nature of the future long-term remedial actions at the site cannot be predicted with any confidence at this time.

While the continuation of pumping at the mutuals' wells could be keeping contamination confined in a pumping trough, it is also possible that it could be encouraging the movement of a pocket of groundwater contamination by drawing it toward the wells. The influence of the mutuals' wells cannot be determined without further study. Therefore, it is premature to assume that continuing the use of the mutuals' wells will prevent plume migration.

It is also not clear at this time whether the water treatment alternatives will fit more cost-effectively into the future long-term remedial actions in the basin than the alternative through which the mutuals dissolve and join another water system. For example, if the longterm solution included installation of a treatment alternative for the larger water system (that the mutuals joined), economies of scale could result in a lower total cost to treat the water, than if separate treatment systems were installed. In addition, the long-term control of the contaminant plume may require shutting down some presently operating wells and drilling new wells. If this occurs, installation of water treatment alternatives at presently operating wells may not result in a lower long-term cost to solve the San Gabriel basin's groundwater contamination problem.

Of course, the treatment alternatives may fit in better with the longterm solution, but it is premature to assume that they will.

In summary, EPA feels the advantages of water treatment alternatives are too uncertain at this time for use as a major factor in the selection of an initial remedial measure at this site.

- One commentor notes that carbon adsorption ranked highest in the focused feasibility study's effectiveness evaluation, even before consideration is made of any potential air pollution impacts of the air-stripping alternative.

  The total effectiveness score for carbon adsorption, air-stripping, and joining with another water system was 96, 94, and 93, respectively. When using a rating system like the one utilized in the effectiveness evaluation of initial remedial measure alternatives, these relatively small differences in total effectiveness scores (under 3.3%) are insignificant for the purposes of selecting an appropriate remedy. As discussed above, EPA believes that the air pollution impact of the air-stripping alternative is insignificant when compared to risk of consuming drinking water with PCE concentration at the DOHS action level. Therefore, EPA has judged all three of these alternatives to be equally effective in minimizing the threat of harm to public health.

Post-Comment Period Activities Concerning the Three Mutual Water Companies

Due to the lack of input provided during the public comment period, the Region decided to go directly to the mutuals' shareholders for their views. This was necessary because of the requirement that the shareholders vote on any selected IRM. A brief fact sheet summarizing the results of the focused feasibility study was prepared. The fact sheet was sent to the governing boards of the three mutuals for distribution to their shareholders (the governing boards did not want the Region to send the fact sheets directly to the shareholders). The fact sheet clearly stated that EPA's recommendation was the air-stripping treatment alternative, but that EPA would also approve alternative D-join with another water system—since it was lower in cost and would be equally effective in protecting public health. The Region requested that the mutuals provide us with input as to which alternative they would prefer.

Rurban Homes Mutual Water Company held its annual shareholders' meeting on February 6, 1984. During the meeting the proposed IRM was discussed. The discussion centered on the carbon adsorption and air-stripping treatment alternatives. The shareholders voted to recommend that EPA selected carbon adsorption alternative. A telephone conversation with a member of the governing board indicated that the decision was based primarily on concern over the potential for air pollution, the difficulty of obtaining an air emission permit, and interest generated by the carbon adsorption system purchased by the Hemlock mutual. Rurban Homes indicated that its members definitely were not willing to dissolve and join another water system. The results of the annual meeting were conveyed to EPA

Region in a letter. [A copy of the fact sheet and Rurban Homes letter to EPA is attached.]

Hemlock and Richwood Mutual Water Companies did not schedule a shareholders' meeting to discuss the IRM. The fact sheets were sent to shareholders, and the general view of the mutuals' members was obtained through discussions with a portion of the membership. A board member of the Hemlock mutual indicated that the choice of most of Hemlock's shareholders was to select carbon adsorption treatment, particularly since they had already purchased a carbon filter system. It was indicated that Hemlock definitely did not want to dissolve and join another water system.

A board member of the Richwood mutual indicated that the majority of the mutuals' shareholders contacted preferred the air-stripping alternative and did not want the mutual to dissolve. The views of relatively few shareholders was obtained, however, and a significant fraction stated that they were willing to dissolve the mutual and join another water system.

Response

Richwood Mutual Water Company indicated to the EPA that the majority of the shareholders contacted approve of EPA's recommendation of treatment of contaminated water with an air-stripping system as the most cost-effective alternative.

Rurban Homes Mutual Water Company indicated to EPA that it prefers the carbon treatment alternative. The carbon treatment alternative for Rurban Homes is estimated to have a capital cost of $568,000 and 5-year present worth operation and maintenance (O&M) costs of $40,000, resulting in a total 5-year cost of $608,000. In contrast, the total cost for an air-stripping treatment system is $277,000--$211,000 in capital costs and $66,000 in 5-year present worth O&M costs. As discussed above, the Region believes that that the air pollution impact of an air-stripping system is insignificant. In addition, since both alternatives are judged to be equally effective in protecting public health, the Region believes that the extra cost for the carbon adsorption system is not justified.

Hemlock Mutual Water Company also indicated that it prefers the carbon treatment alternative. Hemlock is in a different situation than Rurban Homes since they have already purchased a carbon filter system. A CH2M Hill analysis of Hemlock's system requested by EPA judged this purchased system to be underdesigned. The cost to upgrade this system to include the margin of safety based on accepted engineering design criteria was estimated to be $210,000. With the 5-year present worth O&M cost for carbon treatment of Hemlock's wellwater estimated to be $67,000, the total 5-year cost to upgrade Hemlock's purchased carbon filter system would be $277,000. This is well above the total 5-year cost of $182,000 for the air-stripping alternative--$141,000 in capital costs and 5-year present worth O&M costs of $41,000. In addition, it could be difficult to retrofit Hemlock's purchased system due to the limited land available at the Hemlock's well site. An air-stripping system, however, could be accomodated at the site. Therefore, the Region also recommends air-stripping treatment of groundwater as the most cost-effective IRM for the Hemlock Mutual Water Company.

The Region will request all three mutuals to schedule a shareholders' meeting, at which the Region will explain its decision. Also, the Region will assure the mutuals that EPA will have the responsibility to obtain any necessary permits, and will work with the South Coast Air Quality Management District to ensure that there are no serious air pollution impacts associated with implementation of the air-stripping alternative.

At that time, Rurban Homes and Hemlock Mutual Water Companies will be informed that if they do not approve the air-stripping alternative, and insist on obtaining a carbon adsorption treatment system, EPA will implement the carbon adsorption treatment alternative if the mutuals pay the difference between the cost of a the carbon adsorption system and the estimated cost of air-stripping treatment. In addition, EPA acknowledges that the approval of the air-stripping alternative by the Richwood mutual was based on the input of a limited number of the shareholders of the mutual. Therefore, if the Richwood mutual's shareholders vote to dissolve at a shareholders' meeting, EPA will implement alternative D - join with another water system — since it is lower in cost than the air-stripping alternative and has been judged equally effective in protecting the public health.

ADDENDUM

This responsiveness summary was prepared as part of the Record of Decision package and sent from EPA Region 9 to EPA Headquarters in February 1984. This addendum summarizes community relations events that have occured since then which affect the proposed San Gabriel IRM.

EPA Region 9 staff held a meeting for shareholders of the three mutuals on March 8, 1984, to discuss EPA's recommended alternative and request that the shareholders take a formal vote to approve the measure. At that time, EPA informed the mutuals that EPA will implement the carbon adsorption alternative if they pay EPA for the difference in cost over the air-stripping system. In addition, if the mutuals' shareholders voted to dissolve in a formal meeting, EPA will implement the alternative under which the mutuals would join another water system since it is lower in cost than the air-stripping alternative and equally effective in protecting the public health. A fact sheet summarizing the mutuals' options was distributed to the mutuals' shareholders prior to the meeting.

Rurban Homes Mutual Water Company conducted a door-to-door poll of its membership in March, while the Richwood and Hemlock Mutual Water Companies held shareholders' meetings. Rurban Homes and Richwood Mutual Water Companies agreed to accept the recommended alternative—installation of air-stripping treatment systems. The shareholders of Hemlock Mutual Water Company voted to request no action on the part of EPA and to continue with the implementation of their purchased carbon adsorption system. Therefore, EPA will install air-stripping treatment systems for the Rurban Homes and Richwood Mutual Water Companies only.

Copies of the fact sheets distributed to the mutuals' shareholders prior to the meeting, as well as copies of the letters from the three mutuals to EPA describing the results of their shareholders' votes are attached.